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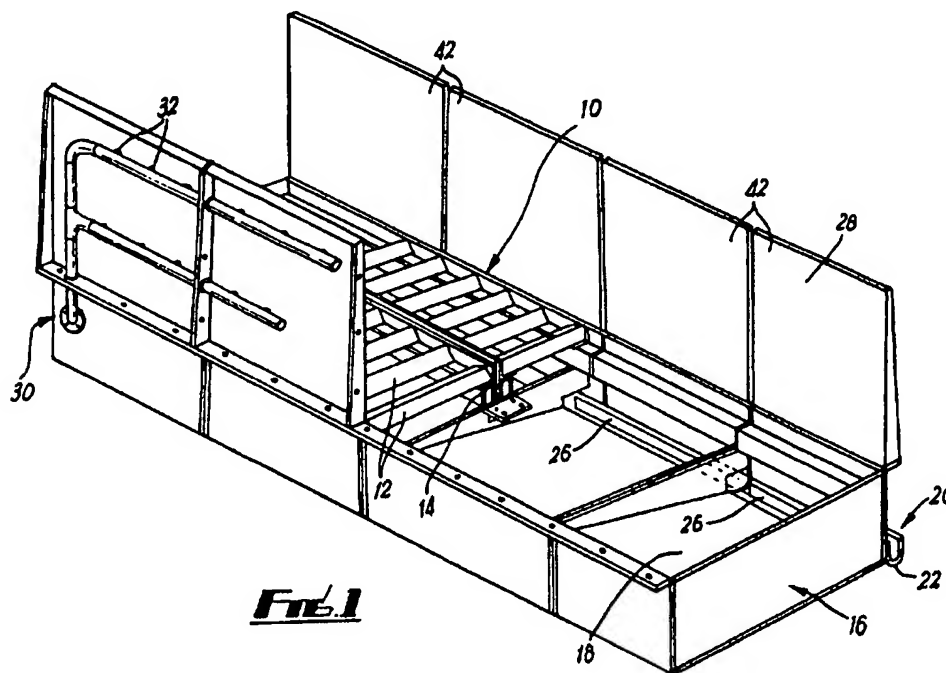
(58) Field of Search

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(54) Abstract Title

Vehicle wheel washing apparatus

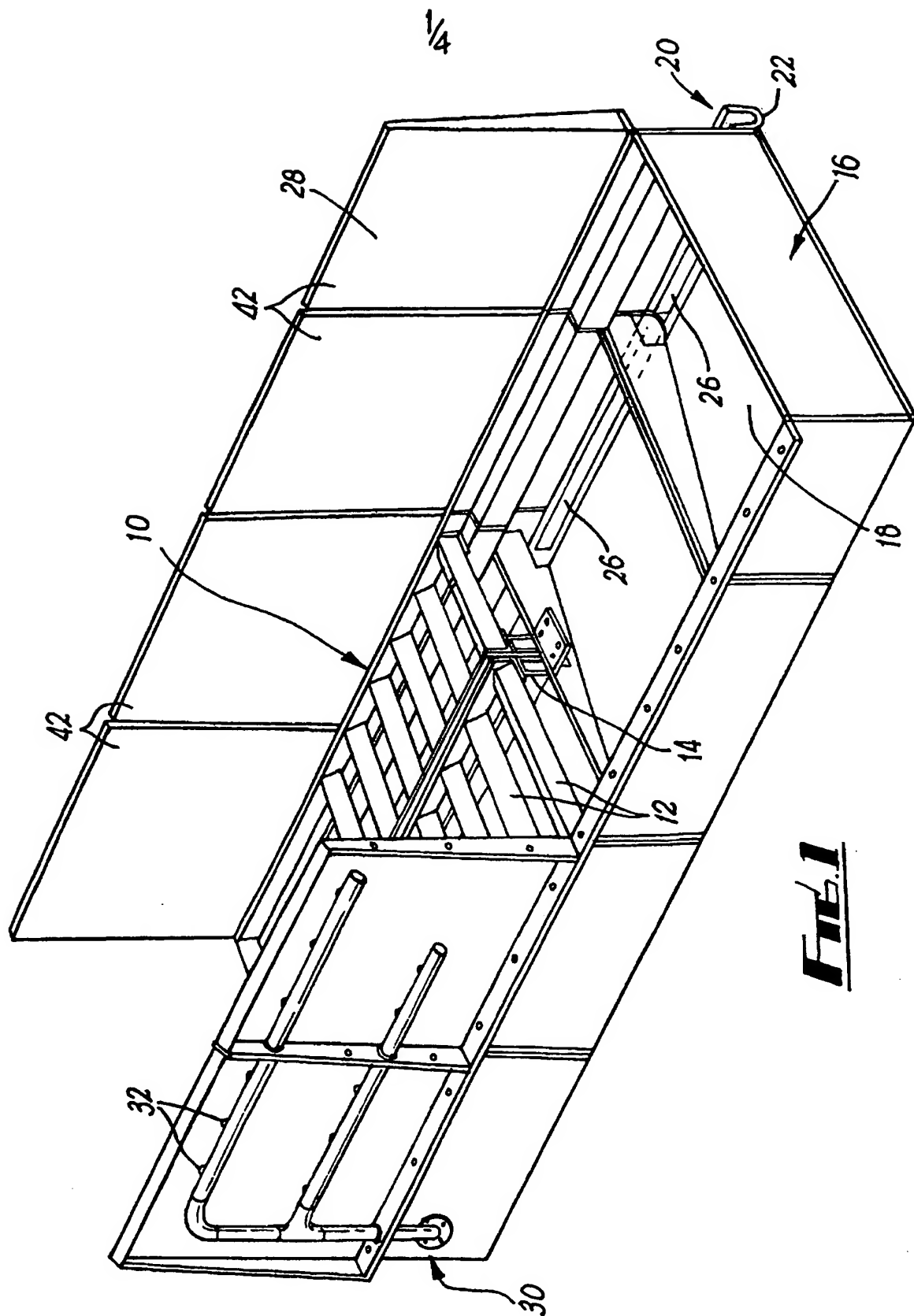
(57) Vehicle wheel washing apparatus 10 comprising a grid 10 onto which a vehicle can be driven. The grid 10 is provided above an open-topped water receiving receptacle 16, the floor 18 of which slopes downwardly to one side. A screw conveyor (24) extends along said side to urge material out the receptacle 16. A plurality of nozzles 32 are provided to permit water to be sprayed onto the vehicle's wheels and subsequently to drop into the receptacle 16. A filter press is provided to permit cleaning of used water, for recycling.



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.

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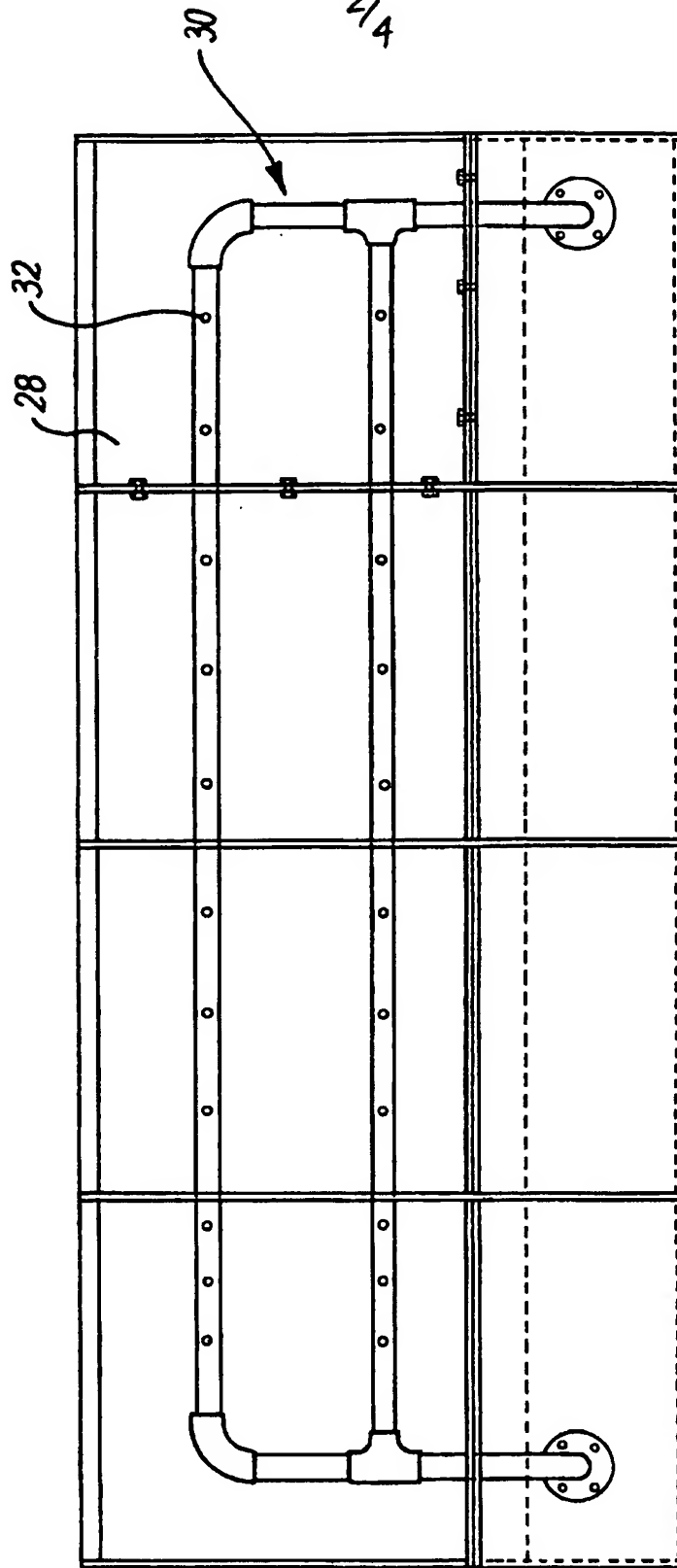


FIG. 2

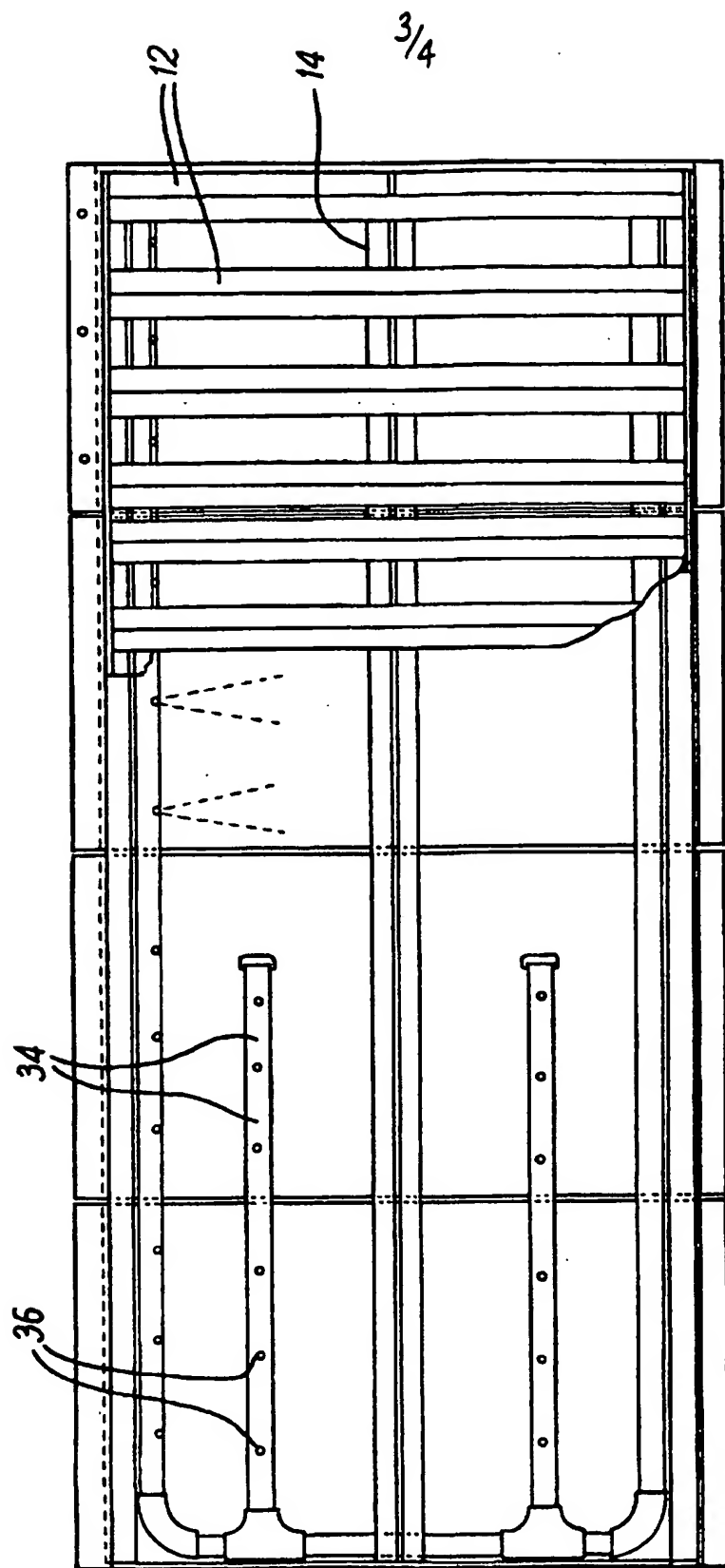
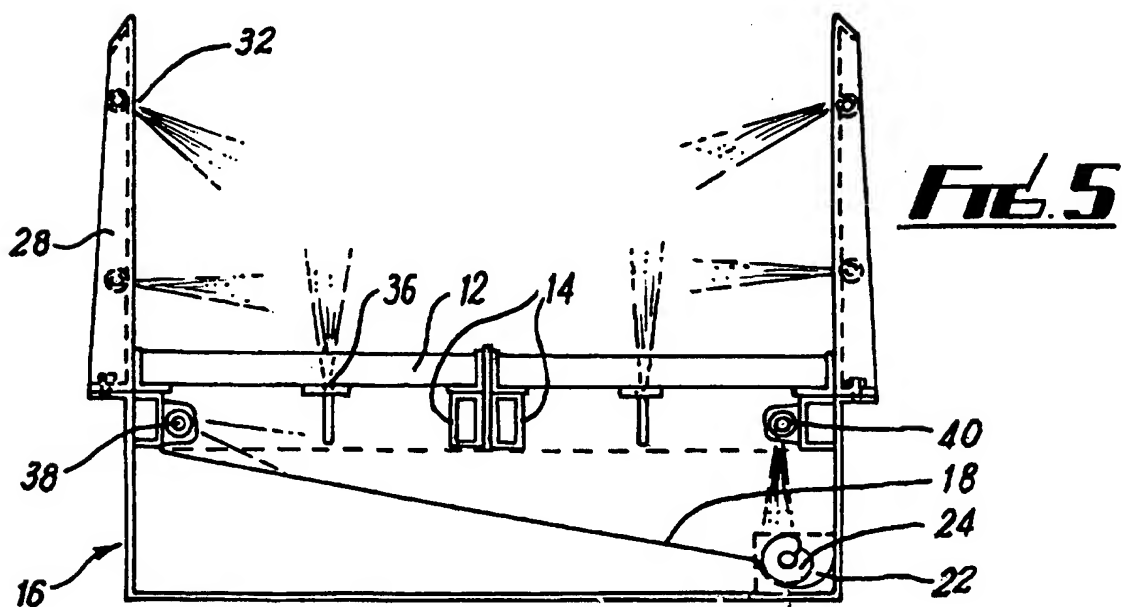
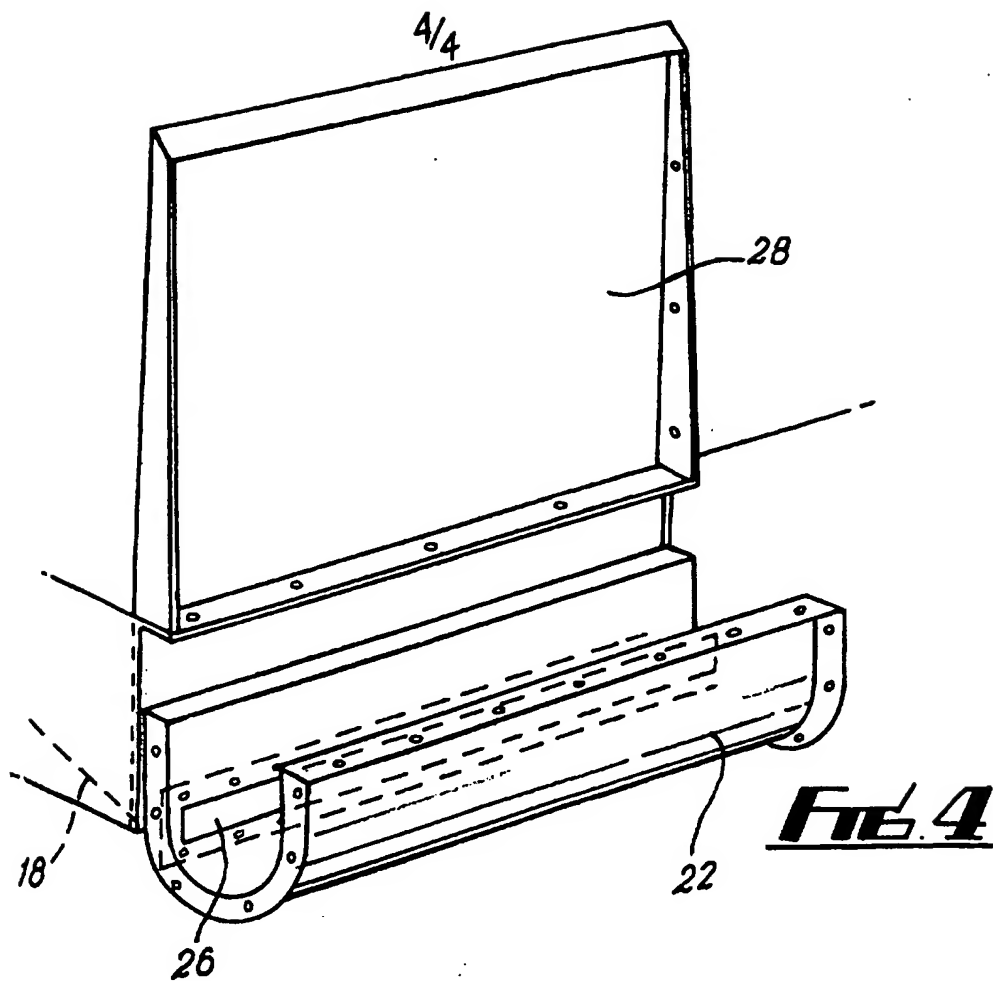


Fig. 3



WASHING APPARATUS

This invention concerns vehicle wheel washing apparatus.

In a number of situations such as quarries, landfill sites and the like it is necessary for vehicle wheels to be washed prior to a vehicle leaving the site. A number of arrangements have been provided for this but these have not been wholly satisfactory. For instance, problems can be encountered with apparatus becoming blocked due to the large amount of solid material washed from the vehicle wheels. Problems can also be encountered with very toxic materials, and particularly in the case of landfill sites.

According to the present invention there is provided vehicle wheel washing apparatus, the apparatus comprising an area onto which a vehicle to be washed can be driven; means for directing water onto the vehicle's wheels in said area to wash the wheels; means for collecting water and other materials coming off the vehicle during washing; and means for cleaning the water used in washing for re-use in washing vehicle wheels.

The apparatus may comprise a grid or other open structure to define said area.

The water collecting means may comprise a receptacle located beneath said area. The floor of the receptacle may slope downwardly to one side such that material include solids landing on the floor of the receptacle tend to flow down towards said side.

Means may be provided for urging material from said one side, and the urging means may comprise a screw conveyor. The urging means may be operable in a gutter means. The urging means may be located outside the receptacle, and desirably in a gutter in communication with and running alongside said receptacle.

The apparatus may comprise walls on either side of the water collecting means to direct water impacting against said walls into said collecting means.

The washing means may comprise means for providing a plurality of jets of water aimed at the wheels of a vehicle in said area. Preferably some of the jets are directed upwards at the underside of the vehicle, whilst others may be directed sideways at a vehicle. The apparatus may be arranged such that jets of water are directed at the floor of the water collecting receptacle and/or at the material urging means to prevent solid material building up thereon.

The water cleaning means may be automatically operable, and/or may comprise a filter press.

The apparatus may comprise first storage means downstream of the material urging means to receive dirty water and other material. The first storage means may comprise a tank, and a plurality of weirs may be provided in the tank to substantially allow liquids but not solids, to pass thereover. The first storage means may be locatable underground.

Second storage means may be provided downstream of the water cleaning means to receive cleaned water.

The apparatus may be modular such that different size apparatus can be formed by using different numbers of modular units.

Embodiments of the present invention will now be described by way of example only and with reference to the accompanying drawings, in which:-

Fig. 1 is a diagrammatic part removed perspective view of a first washing apparatus according to the invention;

Fig. 2 is a diagrammatic side view of the apparatus of Fig. 1;

Fig. 3 is a diagrammatic part removed plan view of the apparatus of Fig. 1;

Fig. 4 is a diagrammatic perspective side view of part of the apparatus of Fig. 1; and

Fig. 5 is a diagrammatic sectional end view of a second apparatus according to the invention.

The drawings show two apparatus usable for washing a vehicle's wheels, for example at a quarry or landfill site, prior to the vehicle leaving the site. The apparatus of Fig. 5 only differs in one significant detail from the apparatus of Figs. 1-4, and the two apparatus shall therefore be described together with the differences highlighted.

The apparatus comprises a grid 10 formed of a plurality of transverse bars 12, onto which grid 10 a lorry can be driven. The bars 12 have a shallow upper apex in cross-section such that water runs thereoff. The centre of the bars 12 are supported on longitudinal centre rails 14.

The grid 10 is provided above an open topped water receiving receptacle 16. The floor 18 of the receptacle 16 slopes downwardly to one side to provide a beach for material to slide down. Material urging means 20 is provided running alongside the lower side of the floor 18 either just outside the receptacle 16 as is shown in the apparatus of Fig. 1-4, or alongside the edge of the receptacle 16 as shown in Fig. 5. The material urging means 20 comprises a gutter 22 in which a screw conveyor 24 is operable. In the case where the gutter 22 is outside of the receptacle 16, a plurality of openings 26 are provided through the side of the gutter 22 alongside the receptacle 16.

Upstanding side walls 28 extend either side of the grid 10 such that any material impacting thereagainst falls onto the grid 10 and therefore into the receptacle 16.

A spray arrangement 30 is provided for directing a plurality of jets of water to clean the wheels of a vehicle on the grid 10. The arrangement 30 comprises two parallel pipes extending along each of the side walls 28 with a plurality of inwardly directed nozzles 32 to provide a generally lateral spray. Two pipes 34 extend beneath the grid 10 from one end thereof for part of the length of the apparatus. A plurality of upwardly pointing nozzles 36 are provided on the pipes 34 to provide an upward spray of water through the grid.

As is shown in Fig. 5 a pipe 38 along one side of the receptacle 16 provides a spray onto the sloping floor 18. A pipe 40 along the other side of the receptacle 16 provides a spray onto the screw conveyor 24.

As is shown in the drawings the apparatus is of modular construction and in the described examples comprises four units 42. Different numbers of units can obviously be provided to provide a different length apparatus.

The apparatus also comprises a number of components which are not shown in the drawings. The material urging means 20 leads via pipework into a dirty water storage reservoir which is desirably located underground. This reservoir comprises a number of sections divided by weirs, such that liquid passes over the weirs but solids are substantially blocked thereby and can be removed automatically or periodically during cleaning.

The dirty water storage reservoir is connected to water cleaning means in the form of a filter press. The filter press is arranged to operate automatically with the filter cloths being chosen dependent on the likely dirt encountered. The clean water discharge from the filter press leads to a clean water storage reservoir for subsequent re-use in spraying onto a vehicle. The filter press can be arranged for instance to operate overnight to replenish clean water which may have been used during the day. The filter cakes can periodically be removed from the filter press and perhaps on a once or twice weekly cycle.

There is thus described wheel washing apparatus which provides for

considerable advantages. The provision of recycling of the water is very advantageous in that obviously the fresh water consumption is greatly reduced, though obviously a certain amount of top-up would be required. Also, with the recycling means there is much less material that requires to be disposed of. Otherwise, considerable lagoons or other arrangements are necessary, and in certain circumstances these can contain some very toxic materials. In the present instance such toxic materials are much more easily handled in a solid form.

The modular arrangement allows for economic manufacture with a number of common components. The external gutter and screw conveyor is found to be advantageous in that this arrangement permits service or cleaning thereof during operation of the wash without the operation of the apparatus being affected in any way.

Various modifications may be made other than those described above without departing from the scope of the invention. For example, the apparatus could be usable for other than as a vehicle wheel wash. A different water cleaning system could be used.

Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

CLAIMS

1. Vehicle wheel washing apparatus, the apparatus comprising an area onto which a vehicle to be washed can be driven; means for directing water onto the vehicle's wheels in said area to wash the wheels; means for collecting water and other materials coming off the vehicle during washing; and means for cleaning the water used in washing for re-use in washing vehicle wheels.
2. Apparatus according to claim 1, wherein the apparatus comprises a grid or other open structure to define said area.
3. Apparatus according to claims 1 or 2, wherein the water collecting means comprises a receptacle located beneath said area.
4. Apparatus according to claim 3, wherein the floor of the receptacle slopes downwardly to one side such that material including solids landing on the floor of the receptacle tend to flow down towards said side.
5. Apparatus according to claim 4, wherein means are provided for urging material from said one side.
6. Apparatus according to claim 5, wherein the urging means comprises a screw conveyor.
7. Apparatus according to claims 5 or 6, wherein the urging means is operable in a gutter means.
8. Apparatus according to any of claims 5 to 7, wherein the urging means is located outside the receptacle.
9. Apparatus according to claim 8 when dependent on claim 7, wherein the urging means is located in a gutter in communication with and running alongside said receptacle.

10. Apparatus according to any of the preceding claims, wherein the apparatus comprises walls on either side of the water collecting means to direct water impacting against said walls into said collecting means.
11. Apparatus according to any of the preceding claims, wherein the washing means comprises means for providing a plurality of jets of water aimed at the wheels of a vehicle in said area.
12. Apparatus according to claim 11, wherein some of the jets are directed upwards at the underside of the vehicle.
13. Apparatus according to claims 11 or 12, wherein some of the jets are directed sideways at a vehicle.
14. Apparatus according to claim 3 or any of claims 4 to 13 when dependent on claim 3, wherein the apparatus is arranged such that jets of water are directed at the floor of the water collecting receptacle to prevent solid material building up thereon.
15. Apparatus according to claim 5 or any of claims 6 to 14 when dependent on claim 5, wherein the apparatus is arranged such that jets of water are directed at the material urging means to prevent solid material building up thereon.
16. Apparatus according to any of the preceding claims, wherein the water cleaning means is automatically operable.
17. Apparatus according to any of the preceding claims, wherein the water cleaning means comprises a filter press.
18. Apparatus according to claim 5 or any of claims 6 to 17 when dependent on claim 5, wherein the apparatus comprises first storage means downstream of the material urging means to receive dirty water and other material.

19. Apparatus according to claim 18, wherein the first storage means comprises a tank.
20. Apparatus according to claim 19, wherein a plurality of weirs are provided in the tank to substantially allow liquids but not solids, to pass thereover.
21. Apparatus according to any of claims 18 to 20, wherein the first storage means is locatable underground.
22. Apparatus according to any of the preceding claims, wherein second storage means are provided downstream of the water cleaning means to receive cleaned water.
23. Apparatus according to any of the preceding claims, wherein the apparatus is modular such that different size apparatus can be formed by using different numbers of modular units.
24. Vehicle wheel washing apparatus substantially as hereinbefore described with reference to Figs. 1 to 4 of the accompanying drawings.
25. Vehicle wheel washing apparatus substantially as hereinbefore described with reference to Fig. 5 of the accompanying drawings.
26. Any novel subject matter or combination including novel subject matter disclosed herein, whether or not within the scope of or relating to the same invention as any of the preceding claims.



INVESTOR IN PEOPLE

Application No: GB 9906266.3
Claims searched: 1-25

Examiner: John Wilson
Date of search: 14 June 2000

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK Cl (Ed.R): A4F
Int Cl (Ed.7): B60S 3/00 3/04
Other: Online:- WPI, EPODOC, PAJ

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2277068 A Jin-Uk Kim - see e.g. fig.9	1-3,5,6, 11-13 at least
X	GB 2231851 A Saunders Highway Equip. - note p.4 ll.17-18	1-5,11,13, at least
X	GB 1442258 William Moseley - note p.2 ll.64-70	1-4, 11,13 at least
X	EP 0041087 A1 Saunders Transport - note p.10 ll.16-19, fig.3	1-3, 11, 13 at least
X	WO 96/03299 A1 Wheelwash Ltd. - note p.2 l.17	1-3,11,13 16,17,22 at least
X	WO 94/19221 A1 Brenner - note p.9 l.34 et seq - recycling	1-3,11, 13, 16,22 at least
X	US 5261433 Wheelwash Ltd. - note col.1 l.67 to col.2 l.2	1-3, 10, 11 13,16,17 at least
X	US 4979536 Midkiff - note ref. to auger in col.9	1-3,5,6 at least

X Document indicating lack of novelty or inventive step	A Document indicating technological background and/or state of the art.
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